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## ON THE NAMES OF AMERICAN FUSULINAS<sup>1</sup>

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Though material both good and abundant is not lacking, our American Fusulinas have never been carefully studied by any American investigator and it has remained for an alien to give us a comprehensive treatment of them. This is done in Schellwien's monograph of the Fusulinidae which since his untimely death has been carried on by other hands, the North American portion by Hans von Staff<sup>2</sup> having recently been published. Of the scientific part of this paper it will suffice to say that it appears to represent much research, yet one cannot but fear that the lack of judgment shown in the proceedings of nomenclature has extended to the scientific portion also.<sup>3</sup> It is to certain points of nomenclature that attention is here directed.

In order not to shock the sensitive reader too violently I will begin with a minor point. Our common Pennsylvanian species of Fusulina was described by Say as *Miliolites secalicus*, the generic reference being later changed to Fusulina. In the monograph by von Staff this is arbitrarily shortened to *Fusulina secalis*. Say's word *secalicus* was clearly derived from the Latin "*secale*, is," a kind of grain, and while a more appropriate termination might have been chosen in forming the adjective from the noun, *secalicus* is a gem of pure latinity compared with many words in the shady lexicon of paleontology. Von Staff's term *secalis* can be nothing

<sup>1</sup> Published by permission of the Director of the U.S. Geological Survey.

<sup>2</sup> *Paleontographica*, Band 59, 4te Lieferung, 1912, pp. 157 ff.

<sup>3</sup> One rarely meets nowadays with a work whose presentation is as poor as this. The text is without plate references and the plates without page references. The distribution of the species is given only incidentally, and apparently is not given completely or in detail. The magnification of the figures is not stated either on the plates themselves or on the plate descriptions. I think it is given somewhere in the text but on my last reference to the work, I did not have time to read it through completely, and so am unable to say definitely that the fact is or is not stated.

but the genitive case of the same noun, *secale*, and is even less appropriate than the adjective, besides which there is very little precedent, in paleontologic literature at all events, for making the species name a common noun in the genitive, although proper nouns in the genitive are not rare. It seems clear that the only acceptable form of this name is *secalica*.

The second point which I propose to raise concerns the status of *Fusulina secalica* Say, *Fusulina centralis* Say, and *Fusulina elongata* Shumard of which the first two are retained as valid species in von Staff's monograph, and the last cited as *Fusulina extensa* var. *californica*, *F. extensa* being a manuscript name of Schellwien's and *californica* a new varietal designation. To be more explicit, Shumard's original description of *Fusulina elongata* is listed as a doubtful synonym and my later citation, in 1908, as an undoubted synonym of the manuscript species and new variety. Von Staff points out the indubitable fact that Shumard's description is very meager, so that the only important feature of *F. elongata* given is the great length, in which respect the later specimens described and figured by me are distinctly, though perhaps not greatly, inferior to Shumard's measurement. For this reason Shumard's work is cited with doubt and mine without doubt in the synonymy. Von Staff's treatment of these three species is inconsistent, for if the description of *F. elongata* is meager it is less meager than that of *F. centralis*, and if the description of *F. elongata* assigns a greater length than has actually been found in later collections, that of *F. secalica* assigns a feature which is quite alien to the whole genus *Fusulina*, a solid axis.

In fact, all three species are too poorly described to be determinable, and since the typical collections are now lost, it is necessary to redefine them in the light of new studies based on other material. The method employed in the case of *F. secalica*<sup>1</sup> and *F. elongata*<sup>2</sup> was to base the later studies on material from about the same locality and horizon as the original, and in this the possibilities of satisfactory results depend largely upon whether one or several species are there present. If more than one are present

<sup>1</sup> *Am. Jour. Sci.* XVII (1904), 234.

<sup>2</sup> *U.S. Geological Survey, Professional Paper* 58, 1908, p. 62.

the statements of the author are liable to afford but inadequate means for determining which was the authentic species.

Very large, very elongated Fusulinas are found in inconceivable multitudes in the Guadalupe Mountains. It is possible that specimens occur which are one-fourth larger than the largest seen by me, but it does not follow that they necessarily belong to a different species. Even if there is a larger form which is a distinct species, it is, humanly speaking, impossible that Shumard could have obtained specimens from this region without much the greater portion of them belonging to the smaller type. It is also, humanly speaking, absolutely certain that even if he had any of the larger shells at all, the smaller ones were included along with them as *F. elongata*. By implication I restricted the name *F. elongata* to the smaller form, if, indeed, there is any specific difference. By implication von Staff would restrict *F. elongata* to the larger form whose existence is hypothetical. Which restriction has priority, if either is valid at all, is a matter of record. Which is the more conservative and reasonable needs no argument. I have really no doubt that the form which I figured in 1908 is the true *F. elongata* of Shumard, while the status of *F. secalica* is much less certain and *F. centralis* has almost no standing at all. Consequently, *F. elongata* is the proper name for the species; the "new variety" *californica* is a straight synonym; and the European or Asiatic form for which Schellwien intended to use the name *extensa* will be a new variety or species as is subsequently determined.

Furthermore, von Staff has "emended"<sup>1</sup> *F. secalica* so as to make it include a different species from that identified by me and also probably a different species from that originally described by Say. As to the first statement there can be little doubt, since von Staff's *F. secalica* is a much more inflated form with much more strongly folded septal walls, and since von Staff himself identifies my *Triticites secalicus* with his *F. centralis* Say.<sup>2</sup> (Nevertheless, in 1912 he placed my citation in the synonymy of *F. secalica*.)

My *Fusulina* (*Triticites*) *secalica* agrees very closely with Say's description, so that von Staff's *F. secalica* differs from Say's *Fusulina* (*Miliolites*) *secalica* in the same particulars in which it differs from

<sup>1</sup> *Neues Jahrbuch*, Beilageband XXVII (1909), 494 ff.

<sup>2</sup> *Op. cit.*, 1909, p. 508, description of Fig. 9, Pl. 8.

my *F. secalica*, namely, it is more inflated and has the septal walls more strongly folded. In evidence of this statement Say gives the length of his typical *F. secalica* as 0.3 inch and the breadth as  $\frac{1}{12}$  inch, so that the ratio is 3.6:1, whereas von Staff gives the ratio in his form as 2.5:1 or 2:1, with a ratio of 3.2:1 and 1.6:1 in extreme forms only (*op. cit.*, p. 496). As to the folding of the septal walls, Say describes the shell as composed of tubes or siphons placed parallel to one another, a phraseology indicating, I should think, chambers uninterrupted by foldings of the inclosing walls. However, Say probably did not study the form by means of sections, and may have based his statement partly on the appearance of the external suture which is always straight, no matter how much the septal walls are folded within the shell.

Dr. J. W. Beede<sup>1</sup> was the first one to revive Say's *F. secalica* and give figures of it. He figures numerous specimens in side view and also one in thin section (axial). He does not, however, state whether the figures are enlargements, nor does he give the localities from which the originals were obtained. The figure representing the thin section is clearly an enlargement, and I suspect that some of the others are also. The largest has an axial length of 18 mm., much greater than that of any *Fusulina* which I have seen from Kansas. The proportions vary considerably in these figures, but with few exceptions they range between 3.6:1 and 3.2:1. This then is a more slender shell than von Staff's *F. secalica*, and if the figures are of natural size, a larger. It has much the same proportions as my *F. secalica* and as Say's original *F. secalica*, but it may be much larger.

The figure showing a thin section is considerably less slender than the others, and has more the shape of von Staff's *F. secalica*. Its proportions are almost exactly as 2:1. From this fact and from the bluntness of the ends (the other figures are terminally somewhat attenuated) I infer that this section does not exactly follow the axis but is somewhat oblique to it, though passing through the initial cell. The septal walls are much simpler than in von Staff's *F. secalica* (cf. Fig. 3, Pl. 15, of his 1912 publication), but, on the other hand, they are represented as porous, a feature apparently characteristic of the latter.

<sup>1</sup> *University Geological Survey of Kansas, Report, Vol. VI (1900), p. 10.*

It is doubtful whether Dr. Beede's *F. secalica* is the same as Say's *F. secalica*; doubtful also whether it is the same as von Staff's, since it is much more slender, possibly larger, and with much less strongly plicated walls, at least as represented in the figure.

My *Triticites* or *Fusulina secalica* came from about the same locality and horizon as the original and agrees with the original description in all the characters mentioned, though this agreement unfortunately is not adequate to establish complete specific identity.

Everyone probably would admit that we do not actually know what true *F. secalica* is, but it might well be argued that the species had been re-established by emendation in the reports of Dr. Beede, or of myself. Dr. Beede's emendation has priority over mine, but mine I believe is more probably the original *F. secalica* of Say. My species is clearly, and Dr. Beede's may well be, distinct from von Staff's. I should not object to seeing Dr. Beede's interpretation or any other supersede my own if it were shown to be the authentic species or more probably the authentic species, but the facts are, if anything, just the opposite, and it would be especially inadvisable to adopt Dr. Beede's interpretation if it entailed the inclusion (as it probably would) of von Staff's also, since his is in all probability distinct from the original.

Until some better evidence comes to light, therefore, it would seem to be necessary to interpret *F. secalica* on the basis of my *Triticites secalicus* of 1904. Von Staff is probably correct in identifying the latter with his *F. centralis*, but as his application of this name is entirely arbitrary, *F. centralis* von Staff must for the present be written in the synonymy of *F. secalica* Say.

On the other hand, *F. secalica* von Staff almost certainly goes out of the synonymy of *F. secalica* Say, together with all the American citations of *F. cylindrica* which agree with it, including possibly *F. secalica* Beede.

The proper name for this species (*F. secalica* von Staff *non* Say) I am unable to suggest. It may be undescribed, but I suspect that it is the authentic *F. ventricosa* (*F. cylindrica* var. *ventricosa*) of Meek and Hayden, and that von Staff's *Girtyina ventricosa* is a still different type. *F. cylindrica* var. *ventricosa* was described (without figures) from Juniata and Manhattan, Kansas, but Meek and Worthen later identified and figured it from a lower horizon

(probably) in Illinois. It is the latter form which von Staff cites as *Girtyina ventricosa*, without recognizing the fact that the original variety *ventricosa* was a much larger and less ventricose<sup>1</sup> form and not improbably a different species. This inference, based on intrinsic characters, is verified by the fact that von Staff recognizes *G. ventricosa* only from Illinois, although having a full series of Kansas specimens in his hands for identification. *G. ventricosa* von Staff, therefore, is almost certainly a distinct species from *F. cylindrica* var. *ventricosa* Meek and Hayden, which is, on the other hand, possibly the same as von Staff's *F. secalica*.

The gentle author has considerable to say about my proposed genus *Triticites*, of which he disapproves in emphatic language and liberal exclamation points, some of which might have been saved if he had fully understood the statements which he was criticizing. The studies of special investigators have, indeed, minimized the differences on which *Triticites* was separated from *Fusulina*, but it was regrettably heedless for von Staff, after condemning *Triticites*, to turn around and propose the new subgenus *Schellwienia* and at the same time to include in *Schellwienia* the type species of *Triticites*, *T. secalicus*. If a new name is needed for the group in question *Triticites* clearly should be employed.

Even if, however, one adopts the classification proposed by von Staff, which I think few will do, a new name is not needed here. He proposes to include both *Fusulina* and *Schwagerina* as subgenera in a single group which he regards as forming one genus and for which he retains the name *Fusulina*. It is for *Fusulina* in the old and strict sense that *Schellwienia* is introduced. This seems to me comparable to Hyatt's course in using *Goniatis* as a general term and introducing *Glyphioceras* for *Goniatis* ss., and it is equally inadmissible. If the author regards *Schwagerina* as a subgenus of *Fusulina*, the proper course is to retain *Fusulina* ss. as the name for the companion group. From the present evidence *Schellwienia* is a synonym of *Triticites*, and *Triticites* of *Fusulina* ss., a name which must be retained in a subgeneric sense even if von Staff's classification is adopted.

<sup>1</sup> Meek gives the length as  $\frac{1}{2}$  inch (13 mm.) and the diameter as  $\frac{1}{16}$  inch. This makes the ratio of course 2.5:1. *Girtyina ventricosa* is described as having an axial length of at most 5 mm. and the ratio as 1.7:1.